PAN AMERICAN fisherman

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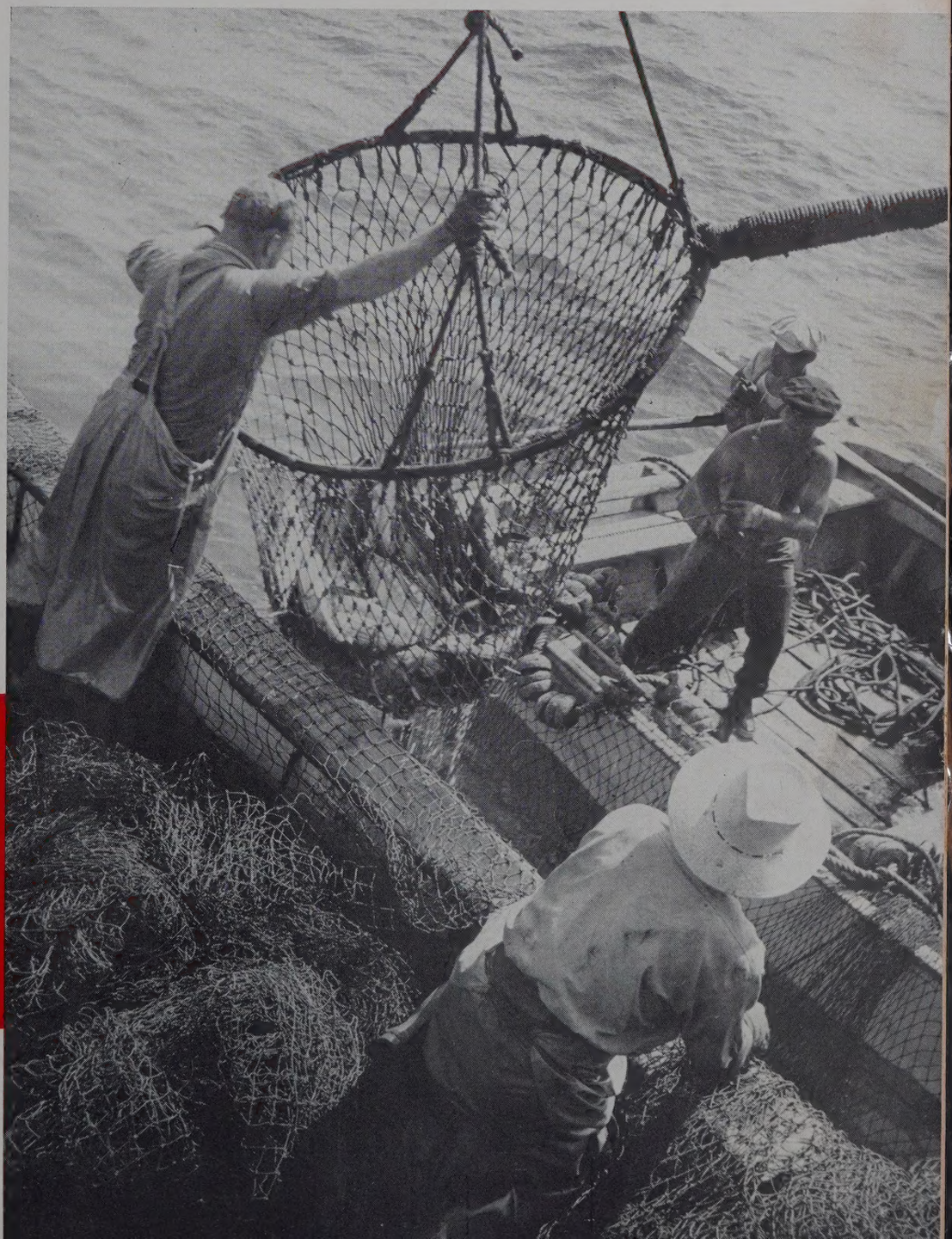

December
1957

SIGNS OF CHRISTMAS...

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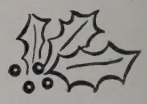
distinctive as... 

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of the Tuna Industry

Joseph J. Madruga
President

Harold F. Cary
General Manager

AMERICAN TUNABOAT ASSOCIATION

No. 1 TUNA LANE • SAN DIEGO, CALIFORNIA

Japanese Operate in Brazilian Fisheries

A Japanese fishery company has brought to Brazil 6 fishing boats to operate off Santos and supply the Sao Paulo market. Five of these boats are trawlers with a capacity of 60 to 100 tons of fish, and one is a purse-seine vessel with a capacity for 200 tons of sardines.

The Japanese company is controlled by Japanese interests and has been incorporated in Brazil under Brazilian law. Under a special waiver from the Federal Government, it may operate its boats with a Japanese crew for two years. At the end of this period, the crew must be nationalized.

The fish trade in Sao Paulo is operated through cooperatives, which include not only fishing, but the subsequent distribution of the catch. The Japanese firm will operate through the newly-formed cooperative Industria de Pesca Atlantica, which is expected to absorb the Cooperative Nipo Brazileira that has already been operating for some time. It is reported that the other two cooperatives, Cooperativa das Pescadores de Santos and Cooperativa de Syndicate des Armadores de Pesca, are concerned over the entry of the Japanese firm into the field with modern equipment and are looking into the possibility of acquiring some modern craft of their own to meet this competition.

Why Is A Fish Slimy?

The slimy secretion is a mucus which acts as a protective device and is very important. The slippery nature of this coating allows a fish to swim with least resistance and it protects the fish from its natural enemies by making it difficult for the attacker to hold the fish. The coating also aids in resisting disease.

After a fish has been handled, much of this mucus is removed. This tends to leave the fish vulnerable to possible attack by fungus which often proves fatal to the fish.—British Columbia *Wildlife Review.*

Port of San Diego Branch Office

In a bid to serve shippers and export brokers in the Los Angeles area, the Port of San Diego has announced the opening of a branch service office at 4419 W. Pico Blvd., Los Angeles, under management of Cal E. Jacobson. Its purpose is to supply data concerning port storage facilities, ship schedules, rates, etc.

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PAN AMERICAN fisherman

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Associate Editor

In This Issue...

Japanese Operate in Brazilian Fisheries 4
Sea Secrets 5
What's New or Different 6
Events of the Year 8
Fingerprinting Fish 10
FWS Biologist Visits Samoa 11
Boat Protection 13
Albacore Transported in "Drunk Tank" 13

OUR LAST ISSUE

After ten years of regular monthly publication, Pan American Fisherman is being merged with Pacific Fisherman, San Francisco and Seattle, effective with the next issue, January 1958. All subscribers will hereafter receive that publication instead of this one. Present subscribers to Pacific Fisherman will have their time properly extended.

Pan American Fisherman is published monthly • Business office—Orange Savings Building, Orange, California, telephone KEllogg 8-5441. Subscription rates in the United States and possessoins, one year $3.00: two years $5.00; five years $10.00. Canada $4.00 per year; all other countries $5.00 per year. Current copies 50c each; back numbers $1.00 each when available. Entered as second class matter March 12, 1953, at the Post Office at Orange, California, under the Act of March 3, 1879. Postmaster: Form 3579 requested.

SEA SECRETS

Question:

What do flying fish eat?

Answer:

Apparently they feed entirely on planktonic organisms, mostly copepods. The planktonic copepods are tiny shrimp-like animals which are carried about by the water currents.

Examination of flying fish stomachs showed that they contained nothing but a pinkish paste of such organisms that showed many crustacean elements.

Question:

It is true that ocean currents can be measured without ever going out to sea? How can this be done?

Answer:

One of the peculiar properties of currents moving in the ocean surface is that, due to the rotation of the earth, the level of the sea slopes downwards from the right hand side to the left hand side when looking in the direction of the current's movement. In the southern hemisphere the opposite is true. Thus, in the Straits of Florida, where the Florida Current, sometimes called here the Gulf Stream, is flowing in a roughly northerly direction, the sea level on the eastern edge, off the Bahamas is over two feet higher than on the western or Florida edge. By measuring the changes in sea level it is thus possible to measure changes in the flow of water. This averages about 25 million tons per second, but it is greater in July and less in November.

There is also an electric current set up by the water flow and this can be measured by means of electrodes at each edge of the current. From the strength of the electrical current it is possible to calculate the flow of water.

This electrical effect is similar to that of a simple dynamo. When an electrical conductor moves in a magnetic field, in the way the dynamo coil moves between magnetic poles, it causes an electrical current. Sea water is an electrical conductor, the earth's magnetic poles provide the magnetic field, therefore, an electrical potential of about 3 volts is set up across the Straits of Florida due to the flow of the Florida Current.

Question:

Is it possible to observe the northern lights from a location in the tropics or the southern hemisphere?

Answer:

The northern lights or aurora borealis commonly occur in high latitudes in the northern hemisphere, but a similar phenomenon occurs in each polar region so we also have southern lights or the aurora australis in the southern hemisphere. Sometimes the general term polar lights is used to apply to the aurora.

These lights at times become visible in places far beyond their usual limits and have been observed in the tropics. A tropical aurora occurred at Singapore during an intense magnetic storm in 1909, and others have been seen from Honolulu, Hawaii, and Bombay, India.

The aurora is one of the many different kinds of atmospheric luminosity. It is produced by the entry into the atmosphere of positively charged atoms, mainly of hydrogen, together with electrons; they come from the sun, and enter the atmosphere with speeds far exceeding those of meteors. The aurora, or any particular part of it, is high above the earth, and can be seen from places over a wide area.

Scientists at present are seeking the help of naval and merchant marine officers as well as airline flight staffs to cooperate in making auroral observations from the great water-covered areas of the globe that they may learn more about them.

Question:

Have fish ever been marked by placing the tag inside the fish?

Answer:

Body-cavity tags have been used extensively in marking small fish. The tag is inserted into the body cavity after a small incision has been made in the body wall. Both colored celluloid and metal tags have been used.

Robert A. Nesbit originally used a strip of colored celluloid to mark squeteague in Cheesapeake Bay in 1931. For marking small fish such as herring and sardines a magnetic body-cavity tag was devised by George A. Roundsefell and Edwin H. Dahlgren in 1932. These magnetic tags had a great advantage over any other types since they could be recovered by the use of electromagnets used at the plants where the fish were brought for processing. Later on an electronic tag detector was developed that could detect the metal tags in the marked fish as they were being unloaded from the fishing vessel.

Other types of tags have been used which consist of a flexible chain or thread that is held by being attached inside the body cavity. In this type of tag some kind of anchor is usually used on the end that is pierced into the fish and an identification mark may be attached on the outside. An illustrated account of the methods of tagging fish appears in the current number of the International Oceanographic Foundation Bulletin.

Question:

Does the bluefin tuna spawn off south Florida?

Answer:

The occurrence of recently spawning fish and eggs and larvæ believed to be those of the bluefin tuna suggest that these fish spawn in the Straits of Florida during May and early June. The main spawning area appears to be on the outer margin of the Florida current between Riding Rocks and Bimini in the Bahamas. The spawning habits of the smaller tuna in the area are at present unknown. The evidence suggests that the American and European tuna represent independent units inasmuch as the spawning time overlaps and the areas of spawning are about 4,000 miles apart.

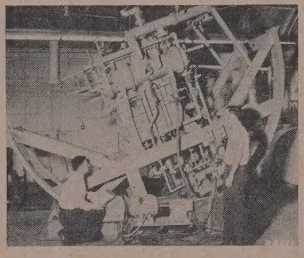
(Continued on page 12)

What's New or Different

Producing Fresh Water from Sea Water

Advantages of the flash evaporator principle for shipboard service are being described (in view above) by Ed Uecker of the Cleaver-Brooks Company before leading naval architects and shipbuilders in New York City. This company's flash evaporators have established an outstanding performance record in producing fresh wtaer from the sea for many months without shutdown for cleaning.

The naval architects were told: "In your ship designs for the future when you must contend with producing fresh water from the sea, you are likely to depend on evaporation or distillation. Your design problem regarding water production will be one of determining which of the available evaporating methods will be best suited for shipboard application."



Flash Evaporators Get "Rock and Roll" Test

Cleaver-Brooks engineers designed a rocking fixture (see cut above) which rocks and rolls their flash evaporator and duplicates operating conditions on the high seas.

This company designs and builds flash and waste heat evaporators for marine and land applications. The 4000 gallon a day flash evaporator illustrated produces pure fresh water from sea water. The company produces units rated up to 50,000 gallons a day for various shipboard applications.

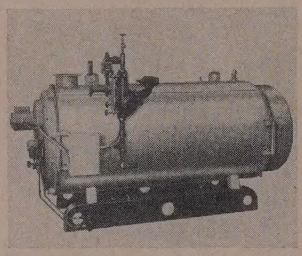
Designed to meet Navy specifications for production of fresh water while undergoing a roll of 45 degrees from horizontal or a 15 degree pitch, the evaporator is put through a movement which duplicates the time of roll at sea.

For details contact Cleaver-Brooks Company, 326 E. Keefe Ave., Milwaukee 12, Wisconsin.

Portable Electric Chart Reader

Designed for accurate, illuminated examination of charts, maps and blueprints, the Pike Portable Electric Chart Reader assures proper identification by bringing the area of examination into instant, perfect focus.

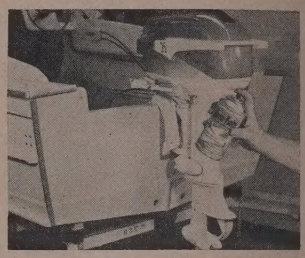
Working from batteries in the handle the field is brightly spotlighted and magnified up to three times. Where power is at hand, an electric plug in model also is available with or without a "benchstand." Write E. W. Pike and Company, Inc., 492 North Avenue, Elizabeth, N. J.



Packaged Boiler for Processing Plants

The new "Monitor" packaged boiler is said to bring large boiler industrial quality to the small and medium sized processing plants. In addition it is a compact unit, as space is an important factor in many operations today.

The Monitor package is completely factory assembled and tested, thus assuring the owner of complete satisfactory operation from the start. For detailed information write Cleaver-Brooks Company, 326 E. Keefe Avenue, Milwaukee 12, Wisconsin.



Protective Boat Spray

Known as Bom-Kote Marine Spray Seal, this colorless preservative is easily applied to decks, hulls, bright work, undersides of grillwork, engines and accessories, outboard motors, etc.—on painted, varnished or unpainted surfaces.

Advantages claimed: Will not chip, crack, peel or darken with age; dries to the touch in 15 to 20 minutes with a high gloss; sets firmly within three days; a non-conductor of electricity. Write The B.O.M. Company, 210 So. Clinton St., Chicago 6, Ill.

Fish Story

Do you like to hunt or fish? If you do it is quite probable the Interior Department knows a great deal about why, when, where and how you do it. The Department last year engaged 300 opiniontakers to determine the fishing and hunting habits of American citizens.

As a result of this study they have produced a 50-page, slick paper, profusely illustrated pamphlet which describes how many persons went fishing or hunting, how long they fished or hunted, how old they were, how much they spent, how far they traveled, but not how many fish they caught, or how many birds and animals they bagged.

According to the Survey, 25,000,000 persons over 12 years of age went hunting or fishing; more people in small towns or rural areas hunted or fished than those in big cities; more young people than older people engaged in these sports; they spent $2,850,979,000; they traveled 10.4 billion miles by automobile; it took them over half a billion days; and two out of three fishermen and five out of six hunters bought licenses.

Ice Holding Units in Shrimp Vessels

One of the chief concerns of vessels trawling for shrimp in the Campeche area of the Gulf of Mexico is the need for sufficient ice and fuel capacity to allow them to remain on the fishing grounds for a prolonged period. The time consumed in steaming back to port to refuel and ice-up cuts heavily into the fishing time and results in lower profit to the vessel owner and crew.

Many innovations such as insulated holds, freighting catches frequently, and the borrowing of ice and fuel from other vessels that have completed a trip, have been applied to the Campeche shrimp vessels as a solution.

An "Ice Holding Unit," not a freezer but a single-unit refrigeration of three-fourths to one ton capacity with six plates or series of coils in the hold, has proven to be a solution and has enabled shrimp vessels to nearly double their fishing time. The cost is reasonable and the units will hold ice adequate for a 40-day trip.

Salmon in Japan

Japan's North Pacific salmon catch from mothership-type operations for the 1957 season totaled 99,984 metric tons, roughly equal to the 100,000-metric-ton quota established for this year under the USSR-Japan Fisheries Agreement. Final figures of the salmon catch from the shore-based drift-net fishing operations in the Aleutians are not available, but the Japanese Fisheries Agency estimates that the 20,000-metric-ton quota was met without difficulty.

According to the Japanese Fisheries Agency, Japan's salmon catch for the 1957 season (May-August 10) from mothership-type operations in the North Pacific was larger than for the previous year when 93,000 metric tons were caught. A breakdown of the quota and the actual salmon catch for 1957 by areas is reported as follows:

	Quotas (Metric Tons)	Actual Cases
Aleutian Waters	87,000	86,984
Okhotsk Sea	13,000	13,000
Total	100,000	99,984

Echo-Sounder on Helicopter for Fish Finding

Fish-finding experiments by helicopter have proved that shoals and their extent can be tracked with an airborne echo-sounder. These tests may revolutionize fisheries that are seeking ways and means to locate fish schools between the surface and the sea bottom.

Early in 1957, trials off the English south coast established that underwater noise resulting from the downbeat of the helicopter rotors on the surface of the water do not affect the echo characteristics shown on the screen.

Thus it would appear that an aircraft operating from a shore base within echonomical range of seasonal fishing grounds can conduct a search of a large area in a short time and make available information on shoal location to a number of vessels.

Similarly, in principle, a ship-borne helicopter operating in fishing grounds in distant waters can conduct a high-speed search to serve a fishing fleet.

Tuna, Sardines, Salmon . . .

EVENTS OF THE YEAR

In the American Fisheries

ANOTHER year marked by more than the usual number of ups and downs—has gone into the history books of the American tuna industry. Much the same can also be said for the U.S. sardine situation.

Both fisheries were beset with strikes and picket lines at various times, arguments about prices to be paid to fishermen and boat owners by the canneries, a number of boats lost by fires and sinkings . . . and over and beyond all the threat of increased competition from abroad.

The Japanese, eager to escape U.S. tariffs and limitations on the quantity of imports for certain types of tuna, started to ship their partially processed tuna to fruit and vegetable canning plants looking for methods to keep their machinery occupied during their off season.

Tuna Auction Sales

Biggest new development of the year in tuna probably was the inauguration of weekly auction sales in San Diego. Here the American Tunaboat Association (ATA) offers to the highest bidder raw fresh and frozen tuna from their member clipper boats. San Diego, San Pedro and Terminal Island tuna canners are participating in the auctions.

Some like the idea and some don't. After four months of operation it is still a controversial subject. The first auction on August 24 was conducted informally; the manager of ATA simply telephoned all tuna canners in Southern California and asked for bids. As a result a block of 6,500 tons of tuna was sold to two San Pedro tuna canners at a price of $230 a ton for yellowfin and $190 a ton for skipjack, with unloading to start the following week.

These prices were $40 a ton less than the previous contract price of $270 for yellowfin and $230 for skipjack. Another canner besides the successful bidders also bid the same prices but offered an unloading schedule which was not satisfactory to ATA.

The auction method of selling tuna from clipper bait boats is new in the history of the Southern California tuna industry. Prior to this such tuna was sold at contract ex-vessel prices, usually established at the beginning of the season with the tuna canners, negotiated annually prior to 1957.

The auction method of selling was adopted in an effort to speed up the unloading of the clippers, which was being delayed from four to five weeks after many boats had arrived in port.

The second auction was held on August 28 when 2,000 tons of tuna were sold to a San Diego canner at the same prices as established at the first auction, with unloading to start the following week. At this auction the industry members interested in bidding attended in person, or sent their representatives, and this method has continued down to the present time.

Weekly auctions have been held each Wednesday since the above dates at the San Diego office of the American Tunaboat Association. At the third auction held on September 4 a block of 500 tons of tuna sold at a high bid of $240 a ton for yellowfin and $200 a ton for skipjack.

Premium on Size of Fish

A newly-adopted provision in this auction was a premium of $10 per ton for yellowfin tuna over 14 pounds and for skipjack tuna over 7½ pounds. This is the first time in the history of the California fishery that tuna have been graded for size and priced on the basis of size.

The fifth auction held on September 18 saw a block of 1,544 tons sell at a new auction high of $250 a ton for yellowfin and $210 for skipjack . . . plus a $10 premium on yellowfin 14 pounds and over, and skipjack 7 pounds and over.

At the sixth auction on September 25 a total of 1,165 tons was sold from seven clipper bait boats to four different canners. Two were small canners bidding for the first time at the ATA auction. Yellowfin brought

$270 a ton for fish over 14 pounds; skipjack $230 a ton for fish over 8 pounds. Fish smaller than sizes indicated sold for $250 and $210 a ton, respectively.

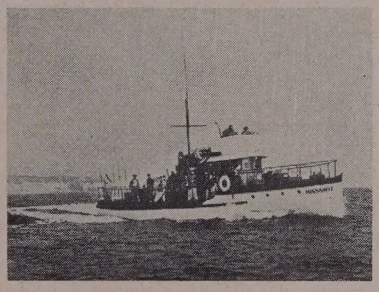
Prices gradually improved and set a new high at the October 9 auction, when a total of 416 tons of tuna aboard two clippers was sold to one canne rat a basic price of $270 a ton for yellowfin and $230 for skipjack, with a premium of $10 a ton for yellowfin over 14 pounds and skipjack over 8 pounds. The third clipper load sold to a smaller canner at the higher bid of $240 a ton straight for skipjack, and $270 a ton for yellowfin plus $10 a ton bonus for fish over 14 pounds.

Sardines and Salmon

Ten to 15 years ago sardines led the catch of American fish, yielding half a million tons annually and supporting a thriving industry from Southern California to Canada. Then without warning, a few years ago, sardines failed to appear off the shores of California, Oregon and Washington. Since then this fishery, too, has had rough going—only some years have been rougher than others.

Nobody knows why the sardines stopped staging their regular summer migrations northward. "The Case of the Missing Sardine" could be the title of a best-selling mystery, if only the researchers plus Sherlock Holmes could work out a satisfactory answer. Perhaps a change in water temperatures or a scarcity of food made these waters no longer satisfactory; fish which swim in vast schools near the surface are sharply affected by such fluctuations.

The supply of West Coast salmon also has been in a tailspin—down 36% in the last ten years. Government scientists, both State and Federal, are trying to find out how much of this drop is due to overfishing and how much to changes in the sea itself.



In the issue of the Saturday Evening Post for November 30, 1957, is an article headed "The Oceans Must Yield More Food," by an occasional contributor to Pan American Fisherman — Lionel A. Walford, Chief, Branch of Fishery Biology, U.S. Department of the Interior.

Dr. Walford pays tribute to the canning industry in making tuna, salmon, sardines, oysters and other such nutritious foods more widely available . . . also to the frozen food industry for bringing all types of fish and shellfish into easy and convenient usage in American homes. Such demands are increasing steadily year by year, and as the population of the country continues apace so must we find more and better ways to increase and utilize the resources of the deep.

The article is interesting and informative on marine biology, modern trends in scientific research, and the importance of the fishing industry. But what the latter wants to know is how to make it pay in today's markets. *

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Pacific Telephone

FINGERPRINTING FISH

By ALFRED V. VOLPE

The Marine Laboratory, University of Miami

THE CAPTURE of a tagged fish is a rare experience to the average angler. His curiosity is immediately aroused by the cryptic message attached to the body or fin of his catch. "How far did this fish travel?" is his first thought. He can obtain this information by mailing the tag, with information as to date and place of capture, to the address given on the tag.

The fishery biologist will obtain much more information from the tag, for tagging offers one of the best means of obtaining accurate data on speed and direction of migration, growth of the fish and on the intensity of fishing effort expended by anglers and commercial fishermen. The tagging of fish is, in fact, one of the most useful tools in the hands of the biologist.

How Tagging Started

Marking or tagging fish is an old practice. Isaac Walton in "The Compleat Angler," written in 1653, mentions having heard that before his time fish were marked by tying ribbons around their tails. This early fish marking was probably done more in a spirit of amusementt han scientific research.

The credit for the first systematic fish tagging belongs to Charles G. Atkins who tagged Atlantic salmon in 1872 at Bucksport, Maine.

At first Atkins attempted to mark salmon by branding the side of the fish and by cutting the fins into a variety of forms. He found that the best marking method was the use of metallic tags attached to the body of the fish.

W. E. Archer, a Scottish biologist, developed another type of tag in 1884, consisting of a platinum or silver tag which was closely attached at the base of the dorsal fin with the ends of wire tightly pressed along the fin.

Another Scotsman, T. Wemyss Fulton, began experimental fish marking in 1889. Fulton tagged thousands of strictly marine fishes of many commercial species. Furthermore, he examined critically various materials that might resist the chemical action of sea water. Pieces of leather, gutta percha, india rubber, lead, copper, zinc, and brass were immersed in sea water for several weeks. Ultimately brass was selected as the most satisfactory substance then available. It was decided that the tag should be fastened around the tail of the fish.

Modern Fish Tags

Fish tags during the last quarter of a century have been generally of three distinct types, which, of course, are constructed and applied in various ways.

The first type consists of two brightly colored plastic disks which are attached to the sides of the fish by running a nickel pin through the muscles of the back, usually under the dorsal fin and then bending the ends in such a manner so that the disks cannot come off.

The second type of tag, often called the strap or cattle tag, was developed by Dr. C. H. Gilbert of Stanford University. This tag is essentially a metal clip fashioned after a type intended originally for ear-marking cattle and sheep. It is attached either to the mouth, gill cover or the upper or lower lobe of the caudal fin by means of a special pair of pliers, which closes the clip.

A third distinct type of tag consists of a strip of colored plastic, properly labelled, which is pushed into the body cavity of the fish by making a small incision in the belly wall. This tag is not visible from the exterior, of course, but when the fish is gutted the tag comes to light and is readily recognized.

An interesting modification of the internal tag has been devised for marking herring in Alaska. Small strips of metal, bearing the identifying numbers, were placed inside the body cavity of thousands of herring, and recovery was accomplished by electro magnets in the delivery machine of the processing plant.

What Tag Is Best?

The best tag for any experiment depends upon several factors, such as the length of time that the tag should remain on the fish. The tagging of adult Pacific salmon in which the whole experiment can occupy only a few months can be accomplished with a strap tag, but the same tag is poor for immature salmon that will remain longer at sea. Body cavity tags have probably the best record for staying on fish, but because of the difficulty of recovery they are often excluded from consideration.

Tags that remain well on one type of fish may be of little value on another. Thus, the strap tag, although excellent when attached to the gill cover of the halibut, has proved very poor on cod, haddock and pollock.

Tagging of the big bluefin tuna for instance presents special difficulties. The answer may lie in a type of tag contrived by a staff member. It consists of a nickel plated monel metal tuna hook stamped with a number and a legend "Return to U. of M. Marine Lab." The hook is attached to a 50 lb. test leader which in turn is fastened to a 3/16 inch cotton line fastened to the stern of the boat. The giant tuna grabs the bait and is hooked. The 50 lb. test piano wire leader holds this powerful fighter just long enough to sink the hook and then breaks under the strain and our fish is tagged. Because of reports that the look corroded in the flesh of the fish, they were later coated with a thin film of plastic.

How Are Tags Recovered?

Recovering tags is a very important part of any tagging program. It is also an expensive operation. The reward must be sufficiently large to act as an inducement. Rewards vary from 25 cents to $2 depending largely on the species of fish, the amount of information required, and the number of fish tagged. An advertising and publicity campaign is essential. This involves contacting anglers clubs and commercial fishermen at regular intervals, for people sometimes forget to turn in the tags. Printed posters, trade bulletins, newspapers, radio and TV are of invaluable aid at this phase of tagging.

The ability to account for the presence of a particular fish or group of fish in time or space furnishes an important tool in fishery management. Happily, the day of marking fish merely out of general curiosity is almost past. Today, a biologist decides what information is needed to solve a specific problem. If marking of fish is indicated as a tool for this, it is so used. The reason for tagging is known. The numbers to be tagged, the sites chosen, the type of tag, season of tagging and so on are decided according to the problem to be solved.

As the recovered tags start coming in, the movements of the fish become evident and, in some instances, the speed of the movement. Some fish travel tremendous distances. A tagged albacore, released in California, was eventually recaptured in Japan.

Tagging may sometimes be used to show the boundaries between groups or populations of fish of the same species. It is important in the management of a fishery to know if the species being fished is one population or several populations, for the intensive fishing of any area of a single population will affect the whole, while this same situation would affect one population in the latter case.

How Old Is the Fish?

Most fish are measured at the time of tagging, and several scales taken from the sides of their bodies. From the scales the biologist is sometimes able to determine the age of the fish in much the same way that we determine the age of a tree by counting the annular rings of the trunk.

The recovery of tagged individuals from which scales are obtained before tagging and after recapture forms a valuable check on the validity of the age interpretations from the scales. Measurements taken at the time of recapture will also show the amount the fish has grown.

Both age and growth are extremely important as a basis for any regulatory measures which may be put into effect. A fast growing fish with a short life span can be fished much more intensively than a slow growing fish with a longer life span, such as the halibut.

Tagging can even help to answer the question of how many fish there are in the sea. It is frequently used to estimate the amount of fish present in a fishery. An example might help to illustrate this point. Suppose we wanted to estimate the number of fish in a pond. We could tag 100 of them. If in our subsequent fishing of this pond we found that approximately one fish in nine caught was a tagged one, this would indicate a population of 900 fish in the pond.

Our pond experiment will also give us an idea of the mortality rate due to fishing. Suppose within one year after tagging our 100 fish we get 50 tags back. Since this is half of the total tagged, it would show a mortality due to fishing of 50% per annum, which in the case of a slow growing, long lived fish might cause serious depletion.

Many thousands of marine fishes are now being tagged along the Atlantic and Pacific coasts by fishery investigators.

Every fisherman can lend aid by promptly returning any fish tag which may be found. The return of the tags is fully as important as the technique of tagging itself and only with the cooperation of fishermen can the biologist succeed in this phase of fishing research. *

FWS Biologist Visits Samoa

The persistent efforts of fishery scientists to pry into the love life of the albacore tuna recently took a research biologist of the Pacific Oceanic Fishery Investigations all the way to American Samoa in search of expectant females of the long-finned tuna species.

According to the director of the Honolulu laboratory of the U. S. Fish and Wildlife Service, the albacore is one of the widest ranging of the tunas, being taken in the temperate waters of both the North and South Pacific as well as in the tropical areas between, but where it spawns and where its young develop is still a mystery to science. Comparatively small, as tunas go, the albacore is highly prized by canners because of the pure white color of its cooked flesh, and it brings a higher price to the fishermen than any other tuna.

There are thriving fisheries for the surface-swimming schools of smaller albacore off the American west coast and in the western Pacific off Japan, and production of the larger, deep-swimming fish by Japanese long-line fishermen in tropical waters of the South Pacific has been increasing rapidly in recent years.

Because of the great commercial value of the species, American and foreign fishery scientists are intensively attacking the problems of its reproduction and early life history, but so far with little success. Albacore with ripe eggs are not taken in the major commercial fisheries, and attempts by Fish and Wildlife Service vessels to collect indentifiable larvae in various areas of the central Pacific have met with no success.

The research biologist's recent visit to American Samoa extended the search for the Albacore spawning grounds to a new area. A fleet of Japanese fishing boats is regularly delivering to the American-operated cannery on the island of Tituila considerable quantities of albacore, most of it caught south of Samoa in the vicinity of the Tonga Islands. These are all the large, deep-swimming fish, taken on longlines, which are thought most likely to form the actively reproducing part of the albacore population.

Sea Secrets

(Questions and Answers)

(Continued from page 5)

Question:

Do fishing vessels use a variable pitch propeller?

Answer:

As yet the variable pitch propeller has not been widely adopted by the commercial fishing industry. This may be partly due to the fact that in most countries a suitable model for fishing vessel use has only recently been put on the market. Or, perhaps it might be that most modern vessels have adequate power for all the operations that they are required to perform. Many Scandinavian vessels have used the variable pitch propeller for several years and it is apparently of great value in the Danish seining and trawling operations which these vessels perform.

The variable pitch propeller is particularly useful to underpowered vessels which require extra power only for short periods such as when towing a net.

Question:

Why do biologists study the spawning habits of fishes?

Answer:

In most species a successful spawning occurring almost every year is necessary in order that the number of fishes be maintained at a high level. If for any reason the spawning is restricted, numbers in future years may be reduced. The success of spawning and the subsequent survival of the eggs and larvæ changes markedly from year to year and these changes are normally the main causes of changes in the abundance of adult fish.

Under natural conditions, when subjected to little or no fishing, fish fluctuate in abundance about an average level. When the number reaches a low level due to natural fluctuations, conservation restrictions may not increase the abundance and may even be harmful. Fishing and other activities, such as dredging, filling, pollution, etc., also cause fish stocks to be reduced or dispersed.

When a decline in the abundance of any species of fish is noticed, it is necessary to determine whether natural fluctuations or man's activities are the main cause. A detailed knowledge of spawning habits and the factors which affect spawning is important in this connection.

While it is known that man's activities usually affect the spawning and egg survival of offshore fishes only to a limited extent, little is known about the effect of such activities on the spawning habits of coastal fishes. Studies made so far show that many such species spawn and spend their larval life in waters adjacent to shorelines which are increasingly becoming subjected to land development schemes. Before the effect on the spawning habits of fishes can be ascertained, it is necessary to determine the "optimum" conditions (most desirable from the point of view of the fishes) of, for example, water temperature, salinity, etc., for spawning and the range of tolerance of the fish. If land development causes changes beyond the limits of tolerance, the spawning activity may be adversely affected.

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BOAT PROTECTION

A completely effective system of preventing electrolytic damage to underwater surfaces of ships and boats has been perfected and is now commercially available through the San Diego firm of Sabins Dohrmann, Inc., inventors of the system.

The system is patented in nearly all maritime nations of the world under the tradename "Cathanode," which is a new technique of using magnesium to control electrolysis. The protection may be accurately controlled under any sea conditions, and Cathanode systems have been installed on all kinds of craft.

Of the 200 ships using Cathanode installations there has been no evidence — in 300 haulouts — of any electrolytic damage to hulls or other underwater steel parts.

Take the case of the "South Coast", wooden-hulled tuna clipper of South Coast Fisheries. Two years ago Sabins Dohrmann installed Cathanode systems in the four 19-ton bait wells, the two 23-ton bait boxes, and on the hull.

"In years past," says Engineer Harold Ikemura, "we had to haul out most of our ammonia pipes in the wells and boxes and galvanize them. This was quite expensive.

"The Cathanode system has been in the wells for two years now and at a recent inspection when we were drydocked there was no evidence of any galvanic action. We haven't any need to haul out the pipes this year."

Ikemura estimates that the ship owners have saved a minimum of $3600 in the four bait wells alone, in two years.

Concerning Cathanode on the hull, he says: "This protects our propeller, our bait pump impellers, and our seacock pipes. They are all in excellent condition after two years. There is no pitting on any of them. We don't even have to polish the propeller now."

The story is similar on other boats using Cathanode. The "Viking," another tuna clipper, reports three years of satisfactory service. And Frank Perry, one of the major tuna boat operators says, "we have had the Cathanode system in our bait wells and on our bottoms for more than two years—without any trace of electrolysis."

Albacore Transported in "Drunk Tank"

Ever hear of an alcoholic albacore? It isn't likely that this species of tuna will ever become an addict, but alcohol (of a heavier variety than the beverage type) is proving effective for sedating the fish during transport.

Scientists from the University of California, Los Angeles, have been experimenting with such techniques at Marineland, a southern California aquarium.

When albacore are caught and placed in a tank to be transported, they swim about wildly and may thrash themselves to death against the sides of the tank. If they survive this rampage their violent movements use up vital oxygen in the crowded tanks, which poses another hazard. This is also true of many other rapidly swimming fishes.

Sedation with the heavy alcohol quiets the fish down considerably, say the UCLA researchers, thus improving chances of safe transport. Sodium amytal and other barbiturates have been used as sedatives for fresh water fish but so far have not proven effective on marine fish.

Abalone Do Not Migrate

Recent findings indicate that the controversy about the migrating abalone have come to an end. The National Automobile Club reports that sportsmen and commercial divers now have some factual information at their disposal for the settlement of an argument that would make the prized mollusk an itinerant.

A four-year study indicates that approximately 4,000 abalone showed no signs of changing their position when check-ups were made after three years. Those abalone living in the zone from the high tide mark out to the depth of 20-25 feet tend to stay there throughout their life time. It was also determined that those abalone released in water deeper than 20 feet did not move into the inshore area.

Once they have passed the free-floating egg stage and settled down, they are beginning to get themselves ready for the harvest which now averages about 4,000,000 pounds annually. Of the two commercially important varieties, the pink abalone from around the Channel Islands and the red ones taken almost entirely from the Morro Bay region make up almost equal shares of the take.

Law of the Sea Conference at Geneva

An international diplomatic conference on the law of the sea will open in Geneva on February 24, 1958, under the auspices of the United Nations. The conference will meet for a period of nine weeks and will examine most aspects of the law of the sea and draw up appropriate international instruments on the subject.

Among the problems to be considered will be the breadth of the territorial sea, the right of "innocent passage," the nationality of ships and whether there should be a special U. N. registration entitling a vessel to fly the U. N. flag and receive U. N. protection, penal jurisdiction in maritime collisions, slave trade, pollution of the sea and piracy, including piratical acts by aircraft if these are directed against ships on the high seas.

These problems will be examined on the basis of draft articles adopted by the U. N. International Law Commission at its 1956 session, including revised sets of articles on fisheries and the conservation of the "living resources of the sea," and on the "continental shelf."

STATEMENT OF THE OWNERSHIP, MANAGEMENT, CIRCULATION, ETC., REQUIRED BY ACT OF CONGRESS OF PAN AMERICAN FISHERMAN, PUBLISHED MONTHLY AT ORANGE, CALIF., FOR OCTOBER 1, 1957.

State of California)
County of Orange) ss.

Before me, a notary public in and for the State and county, aforesaid, personally appeared Briant Sando, who having been duly sworn according to law, deposes and says that he is the publisher of Pan American Fisherman and that the following is to the best of his knowledge and belief, a true statement of the ownership, management, etc., of the aforesaid publication for the date shown in the above caption, required by the Act of August 24, 1912, as amended by the Acts of March 3, 1933 and July 2, 1946, embodied in section 537, Postal Laws and Regulations, to wit:

1. That the names and addresses of the publisher, editor, and business managers are: Publisher, Briant Sando; Editor, Briant Sando; Business Manager, Briant Sando, Orange Savings Bldg., Orange, Calif.

2. That the owners are Briant Sando and Anne M. Sando, Orange Savings Bldg., Orange, Calif.

3. That the known bondholders, mortgagees, and other security holders owning or holding 1 per cent or more of total amount of bonds, mortgages, or other securities are: None.

4. That the two paragraphs next above, giving the names of the owners, stockholders, and security holders, if any, contain not only the list of stockholders and security holders as they appear upon the books of the company but also, in cases where the stockholders or security holders appears upon the books of the company as trustee or in any other fiduciary relation, the name of the person or corporation for whom such trustees is acting, is given; also the said two paragraphs contain statements embracing affiant's full knowledge and belief as to the circumstances and conditions under which stockholders and security holders who do not appear upon the books of the company as trustees hold stock and securities in a capacity other than that of a bona fide owner; and this affiant has no reason to believe that any other person, association, or corporation has any interest direct or indirect in the said stock, bonds or other securities than as so stated by him.

BRIANT SANDO, Publisher

Sworn and subscribed before me this 10th day of October, 1957.

Clyde Newton, Notary Public
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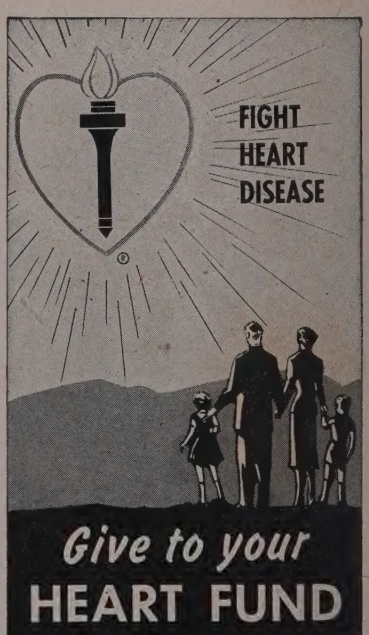

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. . . To All

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